

Effect of Comb Size of Pedigreed Lyallpur Silver Black (LSB) Chicken on Subsequent Performance

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Abstract

Present study was carried out at Poultry Research Center, Department of Poultry Husbandry, University of Agriculture, Faisalabad, Pakistan to investigate the effect of comb size of pedigreed Lyallpur Silver Black on subsequent performance. Pedigreed breeding stock was selected at the age of 16 weeks. The age at first lay, weight of first egg, weight of hen at first egg and comb size of hen at first egg was recorded. The data on egg production, body weight, comb size, age at first lay, hatchability traits like infertile eggs, dead germs, dead in shell, fertility and hatchability percentage were analyzed for genetic variation. Average comb index of cocks were 50.6±6.88, 70.3±7.13, 90.5±9.18 and 91.6±10.46 at 25th, 29th, 39th and 41st week of age, respectively. Average number of eggs per hen up to 40th week was 63.4±9.64 while in first 20 productive week egg number averaged 81.0±12.79. Hatchability percentage, fertility percentage and day old chick weight was 68.9±18.57, 88.5±14.23 and 30.7±2.34, respectively. The statistical analysis for individual comb index at 25th, 29th and 39th week age indicated that there was non significant effect on egg production, egg weight, hatchability and fertility. Comb index of sire at 39th week of age affected the chick weight significantly ($P<0.05$).

Keywords: Chicken, Comb size, Lyallpur Silver Black, Pedigree, performance

Introduction

House hold poultry plays significant role in supplying animal protein by providing 36% of chicken meat and 60% of the table eggs in the country (Anonymous, 2002). The house hold poultry is mainly based upon the indigenous birds which are maintained by rural people. Desi birds are non-descript and have been reported to produce 0.98 kilograms of meat in 6 months and lay on an average about 46 eggs in a year.

In this paradigm Lyallpur Silver Black (LSB) breed was evolved with the main objective to develop a breed that could survive and perform well under vigorous environmental conditions of rural areas. LSB has been reported to have low mortality, better growth and improved egg production than that of Desi (Yaqoob et al., 1965).

The importance of comb size has been repeatedly stressed. Comb size and body weight are important indicators for selection at early age for further breeding of parent stock. Comb is organ of beauty in poultry and an important secondary sexual character; an indicator of bird's biological status with respect to different hormones and is reported to be associated with gonadal development. Genetically the sire comb size has higher influence on egg laying performance than female's own comb size and is moderate to highly heritable trait in poultry. For further improvement, male comb size at 16th week was suggested to select for early maturity and egg number, where as comb size at 29th week was suggested to select for egg mass (Tufvesson et al., 1986).

Keeping in view the importance of male comb size in improving the production potential of chicken, the project reports the productive and reproductive performance of the pedigreed Lyallpur Silver Black chicken selected for better comb size. The present paper also reports the effect of male comb size on the age of first lay in pedigreed flock and estimation of genetic variance in some productive and reproductive traits of the pedigreed flock.

Materials and Methods

The study was carried out at Poultry Research Centre, University of Agriculture, Faisalabad, Pakistan. Pedigreed female stock was selected at the age of 16 weeks and shifted to individual battery cages, fresh clean water was provided for 24 hours, light duration for the stock was 12 hours daily. The age at first lay, weight of first egg, weight of hen at first egg and comb size of hen at first egg was recorded. Male comb size was measured with comb index (height of comb x length of comb) fortnightly from the age of 25 weeks till 45 weeks of age.

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Stud mating system was adopted for breeding purpose in which each male was maintained in separate breeding coop where each female of the specific unit was rotated for 24 hours every 6th day. Individual bird was offered 100gm commercial feed daily and refusal was collected weekly to calculate the weekly feed intake per bird and weekly feed conversion ratio (FCR)/dozen egg as well as /kilogram egg mass.

Daily egg production of individual bird was recorded to calculate hen day production and weekly egg number from onset of production till the end of 20th week of production. Eggs collected from birds during 38th, 39th, 40th and 41st week of age were marked and set each week in an incubator, infertile, dead germ eggs were recorded during candling at 18th day of incubation for each hen. Dead in shell chicks were recorded for each hen along with day old chick weight in individual female and were tagged for four hatches separately, fertility and hatchability for each female was recorded.

The data on egg production, body weight, comb size, age at first lay, hatchability traits like infertile eggs, dead germs, dead in shell, fertility percentage and hatchability percentage were analyzed for genetic variation. A general linear model was used for statistical analysis while parental half-sib correlation was used to determine sire variance (Harvey, 1990; Sokal and Rohlf, 1995).

Results and Discussion

Average comb index of cocks were 50.6±6.88, 70.3±7.13, 90.5±9.18 and 91.6±10.46 at 25th, 29th, 39th and 41st week of age, respectively. Average number of eggs per hen upto 40th week was 63.4±9.64 while in first 20 productive week egg number averaged 81.0±12.79. While hatchability percentage, fertility percentage and day old chick weight was 68.9±18.57, 88.5±14.23 and 30.7±2.34, respectively (Table 1).

Table 1. Different Parameters Estimated in the Study.

Parameter	Average
Comb index of Cock at 25 th week	50.6±6.88
Comb index of Cock at 29 th week	70.3±7.13
Comb index of Cock at 39 th week	90.5±9.18
Comb index of Cock at 41 st week	91.6±10.46
Total No. of eggs upto 40 th weeks of age	63.4±9.64
Total No. of eggs of 20 productive weeks	81.0±12.79
Avg. Weekly Egg Wt. up to 40 th wk of age	41.2±3.31
Hatchability %	68.9±18.57
Fertility %	88.5±14.23
Average day old chick wt.	30.7±2.34

The statistical analysis for individual comb index at 25th, 29th and 39th week age indicated that there was

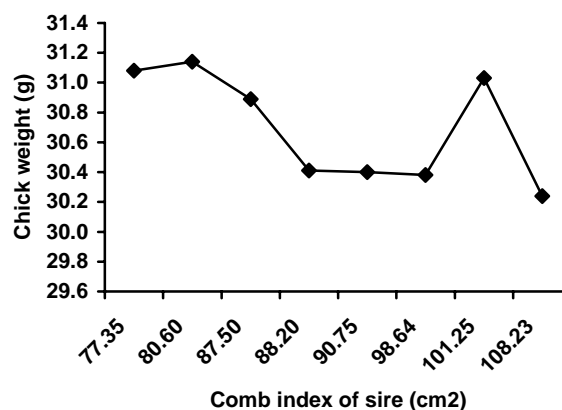
non-significant effect on egg production, egg weight, hatchability and fertility. Comb index of sire at 39th week of age affected the chick weight significantly (P<0.05) while comb index of sire at 25th and 29th week of age had non-significant effect on chick weight.

The comb index of sire at 39th week of age had negative effect on day old chick weight which showed that day old chick weight decreased by an increase in comb index of sire at 39th week of age (Fig 1).

$$Y = 31.128 + (-0.0941x)$$

The regression equation indicated that by 1 cm² increase in comb index of sire at 39th week of age, the day old chick weight decreases by 0.0941g. Similar trend was shown by the comb index at 41st week with same regression equation.

Fig 1 Effect of comb index of sire at 39th week on day old chick weight



Heritability of day old chick weight was computed by parental half-sib correlation and higher estimates were obtained (0.55±0.195), as reported by Abaza *et al.* (1991) in Hungarian yellow breed (0.22), Sundararaman and Ulaganathan (1987) in white leghorn breed (0.43±0.21) and Singh *et al.* (1991) in white leghorn (0.20). Higher heritability indicates that day old chick weight was mostly controlled by genes and can be easily improved by mass selection.

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